## REMARKS

Claims 1 - 39 are pending in this application. Claims 1, 9, 19 and 31 are independent. Applicant proposes amending claims 1, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 26, 27, 28, 31, 32, 33, 34, 35, 36, 37, 38, and 39.

Claims 1 – 39 stand rejected under 35 U.S.C § 101 as be directed to non-statutory subject matter.

Claims 31 – 39 stand rejected under 35 U.S.C. § 102 (b). Claims 1 – 15, 25 – 30, and 38 stand rejected under 35 U.S.C. § 103 (a).

Reconsideration in view of the above-listed amendments and the following remarks is respectfully requested.

### *Interview Summary*

The undersigned wishes to thank Examiner Sciacca for granting the telephonic interview of August 4, 2008.

During the interview, Applicants proposed amendments and arguments substantially consistent with those presented herein. Examiner Sciacca agreed to give further consideration to the arguments upon submission of a written response.

### *Rejection Under 35U.S.C. § 101*

Claims 1 – 39 stand rejected under 35 U.S.C § 101 as be directed to non-statutory subject matter. While not agreeing with the basis for the rejections, Applicant proposes amending the claims in order to advance prosecution.

With respect to claims 1, Applicant proposes to amend the claim to recite elements of a computing system in the recited method. With respect to claim 9, Applicant proposes to amend the claim to recite a computer-readable “storage” medium. With respect to claim 19, Applicant proposes to amend the claim to recite steps performed at a computer device. Claim 31 has been amended to recite a method.

Reconsideration and withdrawal of the rejections under 35 U.S.C § 101 is respectfully requested.

***Rejections under 35 U.S.C. § 102/103***

Claims 31 – 39 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent 5,261,085 (the "085 patent").

Claims 1 – 4, 6 – 14 and 26 – 30 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the 085 patent in view of Paxos Made Simple ("Paxos") from Applicant's IDS dated December 30, 2003.

Claims 5, 15 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the '085 Patent in view of Paxos in further view of U.S. patent publication 2003/0227392 (the "392 Application").

Claim 38 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the '085 Patent in view of U.S. patent publication 2002/0112198 (the "198 Application").

Reconsideration is respectfully requested.

Applicant notes in the patent application specification that:

> [I]n the event of conflicts, the Fast Paxos algorithm can, by performing the first phase of the standard Paxos algorithm, introduce more message delays than would have otherwise been present if the system 10 had been using the standard Paxos algorithm all along. <u>**Because conflicts can arise frequently in an environment in which more than once device may seek to act as a client**</u>**, a reduced message delay consensus algorithm such as Fast Paxos may not provide the expected efficiencies unless it can continue operating properly in the face of conflicting client proposals**. (¶ [0108]).

Applicant has therefore disclosed:

> [A] system can implement a reduced message delay consensus algorithm that is conflict tolerant. Turning to FIG. 8a, an exemplary environment is shown comprising one client device 20, and additional devices 11-15 that are both the constituent devices of the distributed computing system 10, and can act as clients of the system 10. Furthermore, as shown, **each of the devices 11-15 and the client 20 can be assigned a client identifier**. In one embodiment contemplated by the present

> invention, the constituent devices of the system 10 essentially **vote for a combination of a proposed function, and the particular device that proposed the function**. Thus, **while a device might vote for a proposed function from one device, it might not vote for the same proposed function if it was proposed by a different device**. As will be shown in more detail below, a reference to the identifier of the device proposing the function can help provide conflict tolerance. (¶ [0110]).

Claim 1 recites:

> A method for selecting a value in a distributed computing system, the method comprising:
>
> **receiving at a computing device from a first client <u>a first message comprising a first proposed value and a first client identifier corresponding to the first client</u>**;
>
> voting at the computing device for the first proposed value;
>
> transmitting from the computing device a first indication of the voting for the first proposed value to one or more devices; and
>
> transmitting from the computing device a first result of the voting for the first proposed value to the first client,
>
> wherein the voting for the first proposed value, the transmitting the first indication of the voting for the first proposed value, and the transmitting the first result **are not performed if <u>a second message is received at the computing device from a second client</u>, the second message comprising a second proposed value and a second client identifier corresponding to a second client, <u>the second client identifier being more dominant than the first client identifier and the second proposed value having been previously voted for</u>**.

In order for a reference to anticipate this claim, or a set of references to render the claim obvious, the recited language and its combination in the recited method must be taught by the prior art. The undersigned respectfully submits that the cited references do not teach the emphasized language and cannot possibly teach or even suggest the recited method.

The 085 patent discloses system for implementing a state machine. In the 085 patent, one process in a network of processes is chosen as the leader, and that leader is responsible for broadcasting state machine commands to other processes. (Abstract). Each command is

broadcast through a numbered ballot and each process may either accept the command or not vote. (Abstract). In order for a command to be issued, the command must be voted for by a majority of the processes in the system. (Abstract).

Thus, the 085 patent discloses a system wherein a *single leader* is designated to broadcast machine commands and the individual processes vote on the commands. In contrast to claim 1, the 085 patent does not disclose or suggest "receiving at a computing device <u>**from a first client**</u> **a first message comprising a first proposed value and a first client identifier corresponding to the first client"** and receiving "**a second message . . . at the computing device <u>from a second client</u>, the second message comprising a second proposed value and a second client identifier corresponding to a second client**." Rather, in the system disclosed in the 085 patent, it appears that messages are received from a single "client," namely the "leader." In other words, the 085 patent does not disclose or suggest receiving a first message "from a first client" and receiving a second message "from a second client." Indeed, the concept of selecting a leader teaches away from a system wherein messages may be received from a plurality of client devices; if there was a leader, messages would not be received from a plurality of client devices.

Moreover, because the 085 patent appears to teach a *single* leader, and not receiving messages from a first client and a second client, the 085 patent cannot possibly teach "not" performing "the voting for the first proposed value, the transmitting the first indication of the voting for the first proposed value, and the transmitting the first result" if "a second message is received . . . **the second message comprising a second proposed value and a second client identifier corresponding to a second client, <u>the second client identifier being more dominant than the first client identifier</u> and the second proposed value having been previously voted for**."

The Office also relies upon the Paxos algorithm for the rejection. Applicant acknowledges the existence of Paxos, and, in fact, discusses the Paxos algorithm and another algorithm known as the Fast Paxos algorithm in the present application. (See e.g., ¶¶ [0008] – [0013]). Applicant has noted that both algorithms have limitations. In particular, the Paxos algorithm introduces delays:

> However, the Paxos algorithm adds message delays between when a client sends a request for the distributed system to execute a command, and when the client receives the results from the execution that command. Specifically, even if the client transmits a request to a leader, and even if the leader has already learned of previously voted on proposals, and thus has completed the first phase of the Paxos algorithm, there can still be two or more message delays between the transmission of the request from the client, and the transmission of the results to the client. Furthermore, the Paxos algorithm can require the presence of a leader device that receives client requests and determines the appropriate functions to submit for a vote to the devices of the distributed computing system. Should such a leader device fail, a new leader may not take its place immediately, leaving the distributed computing system idle and the client waiting for a response to its requests. (Application, ¶ [0011]).

The Fast Paxos algorithm cannot tolerate a conflict among two or more clients.

> [T]he Fast Paxos algorithm cannot tolerate a conflict among two or more clients. Specifically, if two or more clients propose different functions at approximately the same time, the devices may be unable to choose between the different functions. In such a case, the system must stop using the Fast Paxos algorithm and return to the regular Paxos algorithm, with the leader beginning with the first phase, in an effort to resolve the discrepancy among the devices in the system. In such a case, the two or more clients that submitted the conflicting proposals may experience an even greater delay in receiving their responses than if the system had never attempted to operate using the Fast Paxos algorithm. (Application, ¶ [0013]).

Applicant has developed a conflict tolerant reduced message delay consensus algorithm. In particular, Applicant discloses

> [A] system can implement a reduced message delay consensus algorithm that is conflict tolerant. Turning to FIG. 8a, an exemplary environment is shown comprising one client device 20, and additional devices 11-15 that are both the constituent devices of the distributed computing system 10, and can act as clients of the system 10. Furthermore, as shown, each of the devices 11-15 and the client 20 can be assigned a client identifier. In one embodiment contemplated by the present invention, **the constituent devices of the system 10 essentially**

> **vote for a combination of a proposed function, and the particular device that proposed the function. Thus, while a device might vote for a proposed function from one device, it might not vote for the same proposed function if it was proposed by a different device. <u>As will be shown in more detail below, a reference to the identifier of the device proposing the function can help provide conflict tolerance</u>**. (Application, ¶ [0110]).

In contrast to claim 1, Paxos does not disclose or suggest "receiving at a computing device **<u>from a first client</u> a first message comprising a first proposed value <u>and a first client identifier corresponding to the first client</u>"** and receiving "**a second message . . . at the computing device <u>from a second client</u>, the second message comprising a second proposed value and <u>a second client identifier corresponding to a second client</u>**." Rather, in the system disclosed by Paxos, proposals are received that are identified by a *proposal number*. The proposal numbers of Paxos do not comprise "a first proposed valued and **a first client identifier corresponding to the first client**" and "a second proposed value and a **second client identifier corresponding to a second client**."

Furthermore, the Paxos algorithm does not disclose "not" performing "the voting for the first proposed value, the transmitting the first indication of the voting for the first proposed value, and the transmitting the first result" **if** "a second message is received . . . **the second message comprising a second proposed value and a second client identifier corresponding to a second client, <u>the second client identifier being more dominant than the first client identifier</u> and the second proposed value having been previously voted for**." Rather, the Paxos algorithm relies on proposal numbers to determine what proposal to execute. Paxos does not determine or consider "the second client identifier being more dominant than the first client identifier." Indeed, the concept is entirely absent.

The Office notes that Paxos discloses selecting a value in a network where there are multiple acceptors. (Office Action, p. 9). In particular, Paxos discloses that a value is chosen when a large enough number of acceptors accept the value.

> A proposer sends a proposed value to a set of acceptors. An acceptor may accept the proposed value. The value is chosen when a large enough set of acceptors have accepted it.

But selecting a value because enough acceptors have accepted the value is not the same or even similar to "not" performing various activities "if" "a second message is received . . . **the second message comprising a second proposed value and a second client identifier corresponding to a second client, <u>the second client identifier being more dominant than the first client identifier</u>**." Rather, in Paxos, the selected value is based on whether a plurality of other acceptors have also accepted. The selection is not determined by whether a client identifier from a second client is more dominant than a first.

The Office further notes that Paxos discloses an acceptor accepting a proposed value if it has not already responded to a request having a greater number. (Office Action, p. 9).

> An acceptor can accept a proposal numbered n if it has not responded to a prepare request having a number greater than n.

Thus, Paxos teaches selecting a proposal based upon a ***proposal number***. The referenced section of Paxos does not indicate that a proposal is selected based upon a ***client identifier*** as recited in the claim. There is not indication that a client identifier is even available to be considered in the Paxos algorithm.

Therefore, because neither the 085 patent nor Paxos disclose the emphasized claim language, even in combination the references cannot be said to disclose or suggest the recited combination of claim 1. For similar reasons, claims 9, 19 and 31 patentably define over the references.

Applicant notes that other claims further define over the references for additional reasons. For example, claim 33 recites:

> wherein the **<u>dedicated client device is identified by a least dominant client identifier</u>**.

The Office cites to the 085 patent for the proposition that the above-reference language of claim 33 is anticipated by the following except: "the selection requirement is then satisfied by having one of the processes send a message containing its identification number to every other process every." Applicant respectfully disagrees. As noted above, the 085 patent relies upon a "leader." The 085 patent does not disclose receiving a first message "from a first client" and receiving a second message "from a second client." Accordingly, the 085 patent

does not disclose selecting a proposed value based upon a dominant client identifier. The 085 patent likewise does not disclose identifying a dedicated client device by a least dominant identifier. For this additional reason, the 085 patent does not teach or disclose each and every element of claim 33. The Applicant therefore respectfully submits that claim 33 is patentable over the 085 patent.

Reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 and 103 is respectfully solicited.

## CONCLUSION

The undersigned respectfully submits that pending claims are allowable and the application is in condition for allowance. A Notice of Allowance is respectfully solicited.

Examiner Sciacca is invited to call the undersigned in the event a telephone interview will advance prosecution of this application.

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/John E. McGlynn/
John E. McGlynn
Registration No. 42,863

Woodcock Washburn LLP
Cira Centre
2929 Arch Street, 12th Floor
Philadelphia, PA 19104-2891
Telephone: (215) 568-3100
Facsimile: (215) 568-3439